**Mutations Activity: Part 1 (Designing a Mutation)**

Mrs. Krouse, Pre-AP Biology

***Directions:*** *Write out a 12 base DNA sequence (one strand) in the space given below. Divide it up into units of three bases using slash marks (/). Then, write a mutated DNA sequence in which you…*

1. *Add a base*
2. *Delete a base*
3. *Change (aka substitute) a base*

*Note: Your original DNA sequence should not contain the following sequences of three bases: ATT, ATC, ACT. These DNA triplets will code for stop codons (UAA, UAG, UGA) in the original mRNA sequence. We do not want ANY stop codons in the original mRNA sequence (even at the end!)*

**Original DNA:**

**Mutated DNA:**

***Directions:***

*-Use the original DNA given to determine the original mRNA sequence. Divide the mRNA sequence up into units of three bases using slash marks (/).*

*-Use the mRNA codons and the codon chart in your notes to determine the original amino acid sequence. Abbreviate the amino acids with the first three letters of their names.*

*-Use the mutated DNA given to determine the mutated mRNA sequence. Divide the mRNA sequence up into units of three bases using slash marks (/).*

*-Use the mRNA codons and the codon chart in your notes to determine the mutated amino acid sequence. Abbreviate the amino acids with the first three letters of their names.*

**Original mRNA:**

**Original Amino Acids:**

**Mutated mRNA:**

**Mutated Amino Acids:**

***Directions:*** *Answer the following questions thoroughly and accurately.*

1. What type of mutation did you create—point or frameshift? How do you know?
2. If it was a point mutation, what type of point mutation was it—silent, missense, or nonsense? If it was a frameshift mutation, what type of frameshift mutation was it—insertion or deletion?
3. Describe the changes that occurred in the amino acid sequence as a result of the mutation.

**Mutations Activity: Part 2 (Identifying a Mutation)**

Mrs. Krouse, Pre-AP Biology

***Directions:***

*-Record the original DNA sequence and mutated DNA sequence from the first page of another group’s packet. (DO NOT LOOK AT THE SECOND AND THIRD PAGES IN THE OTHER GROUP’S PACKET AT THIS POINT)*

*-Use the original DNA given to determine the original mRNA sequence. Divide the mRNA sequence up into units of three bases using slash marks (/).*

*-Use the mRNA codons and the codon chart in your notes to determine the original amino acid sequence. Abbreviate the amino acids with the first three letters of their names.*

*-Use the mutated DNA given to determine the mutated mRNA sequence. Divide the mRNA sequence up into units of three bases using slash marks (/).*

*-Use the mRNA codons and the codon chart in your notes to determine the mutated amino acid sequence. Abbreviate the amino acids with the first three letters of their names.*

*-Answer the questions given on the back of this page thoroughly and accurately.*

*-Now, you can look at the second and third pages in the other group’s packet to check your work on the mRNA sequences, amino acid sequences, and follow-up questions. If you have made an error, make changes to your work. If you think the other group has made an error in their “answer key,” speak to them about it. If your groups cannot reach a decision as to whose answer is correct, ask Mrs. Krouse*

**Original DNA:**

**Mutated DNA:**

**Original mRNA:**

**Original Amino Acids:**

**Mutated mRNA:**

**Mutated Amino Acids:**

1. What type of mutation did the other group create—point or frameshift? How do you know?
2. If it was a point mutation, what type of point mutation was it—silent, missense, or nonsense? If it was a frameshift mutation, what type of frameshift mutation was it—insertion or deletion?
3. Describe the changes that occurred in the amino acid sequence as a result of the mutation.